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ABSTRACT

Identified in this study are the factors which affect the user's capacity to seek out and utilize information, and the factors which serve as obstacles to information use. Factors relating to both organizational and individual use include level of use, user skills, and user motivation; differentiation of level of use is presented in three levels: user, potential user, and non-user. Eight states of use are later shown in Appendix A. Factors influencing user capacity in an organizational sense include structure, climate, and environment; structure refers to size, degree of centralization, and information flow. Factors in the organizational climate are identified as policy, problem-solving procedures, employee orientation, and leadership; environment encompasses budgetary considerations, maintenance, and the interface of innovations with general agency operations. The individual user analysis indicates that a person's past experiences and personality traits form his/her attitudes about using new information. Market segmentation, or breakdown of individuals according to their information needs, has applications for the design of program resources or information packages. Major segmentation variables are outlined in Appendix B, and 40 references are listed. (SW)

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INFORMATION ABOUT USERS AND USAGES:

A LITERATURE REVIEW

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PREFACE

The State Dissemination Grants Program is a major initiative within the mission of the National Institute of Education "to promote educational equity and improve the quality of educational practice." The Program can be seen as contributing to an emerging nationwide configuration of efforts for the improvement of educational practice. NIE expects the State Dissemination Grants Program (SDGP) will aid the development of a nationwide capability for educational improvement by assisting a group of significant actors, State education agencies (SEA), to strengthen their abilities to provide "comprehensive and generalized" dissemination services to their clientele.

Under the sponsorship of the NIE's Program on Dissemination and Improvement of Practice, NTS Research Corporation is conducting a study of the capacity building component of the State Dissemination Grants Program (NIE Contract No. 400-76-0166, October 1976). The purpose of this study is quite simply to determine the program's effects. Subsumed under this basic question are two major questions guiding the NTS study:

- Is dissemination capacity being built as a result of this program?
- What services and products result from the program?

The evaluation is in two phases. Phase I of the study, an eleven-month design phase that extended from October 1976 through August 1977, was devoted to describing the program, clarifying and translating the program's goals into measurable variables, and developing a design, appropriate instrumentation, and data collection and analysis procedures for the study. Phase II, the full-scale evaluation, was initiated in September 1978, and is scheduled to conclude in April 1980. Phase II objectives include describing and tracking the process of building dissemination capacity, documenting the impact of the program, sharing the study findings and analyses with NIE and the states to promote program and project improvement, and developing mechanisms for the continual evaluation and measurement of capacity building.

Five major documents were produced during Phase I of the NTS study:

- 1977 State Abstracts (September 1977) contains summaries of twenty-four capacity building projects. Included are the ten states initially funded in 1975 and the fourteen additional projects funded in 1976. The abstracts document dissemination activities in the SEAs as of May 1977.
- State Reports (July 1977) contains extensive documentation on nine of the first states funded through the capacity building component of the State Dissemination Grants Program. The mini-case studies examine dissemination activities in nine SEAs as of May 1977.
- A Compendium of Evaluation and Documentation Forms Currently in Use by State Capacity Building Projects (July 1977) is a compilation of selected instrumentation used by the capacity building projects. An accompanying narrative describes the included materials.

- Final Design Report of the Evaluation of the State Capacity Building Grants Program (July 1977) is a two-volume report. Volume I contains the proposed designs for the full-scale evaluation. Volume II contains proposed instrumentation.

- Building Capacity in Dissemination: Literature Review (March 1977) was used to inform the design process. The Literature Review consists of two separate but related products. The first summarizes dissemination literature, using an organizing framework which parallels that followed in NTS design work. The second product consists of an extensive bibliography and outline of topics covered in the Review. Each entry in the outline is followed by a list of relevant citations.

Major reports prepared during Phase II of the NTS study include:

- This report, Information About Users and Usages: A Literature Review (February 1979), is a companion document to A Conceptual Framework. The review was prepared as part of the design process used to develop the framework.

- Intelligence for Dissemination Service Capacity: A Conceptual Framework (February 1979) expands an earlier framework into a heuristic device for studying users of educational dissemination services. This conceptual framework was completed to guide the development and refinement of questions, variables and instrumentation for the service capacity component of the NTS study.

- Improving State Dissemination Efforts: An Evaluation of NIE's State Dissemination Grants Program (March 1979), the first-year technical interim report on the full-scale evaluation of capacity building component of the State Dissemination Grants Program. Included is an overview of the evaluation, purposes of the study, framework, evaluation questions, sampling plans, data collection methods, analytic techniques and findings. The processes used by SEAs to develop capacity for gaining access to information resources and for linking such resources to the needs of educators are described by studying SEAs that have received capacity building grants. Impacts of the capacity building effort are also identified and discussed.

- 1978 State Abstracts (March 1979) contains summaries of dissemination activities in twenty-nine SEA as of December 1978. Included are nine SEAs initially funded in 1975, fourteen additional projects initially funded in 1976, and six SEAs initially funded in 1977. An introductory chapter presents comparisons and contrasts among the individual projects.

- Request for OMB Clearance with Supporting Documents for the Evaluation of the State Capacity Building Program in Dissemination (Revised June 1978) is the justification and instrumentation package prepared for and approved by the Office of Management and Budget for use in the evaluation.

- A Framework for the Evaluation of the State Capacity Building Program (May 1978) presents the organizing framework for the evaluation. The focus of the evaluation, dissemination capacity, is conceptualized to consist of two major components: service capacity and user capacity. The first year of the full-scale evaluation examines service capacity; further design work will specify the focus of the second year's evaluation.

- The Client Assessment Package (December 1978) is a set of five machine-readable instruments developed by NTS to record the process of seeking and using information and assistance for educational improvement. Linked by a common identification field, the five forms in the package are the Service Form, Process Form, Linker Form, Immediate Feedback Form and Client Assessment Form. An accompanying Guide to the Client Assessment Package provides instructions for completing and using the forms.

Additional documents will be prepared during the second year of the full-scale study. By evaluating the process of developing dissemination capacity in selected SEAs and by assessing the program's effects, the NTS study aims to provide basic informatin for the improvement of state dissemination efforts, to develop mechanisms for the continual evaluation and measurement of dissemination capacity, and by so doing, to foster the development of a nationwide educational dissemination system or configuration.

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INFORMATION ABOUT USERS AND USAGES: A LITERATURE REVIEW

Introduction

Over the past decade, the number of studies dealing with information use and dissemination in education has increased. This proliferation has been due, in part, to the interest of educators in the effects of various federally-funded programs dealing with innovations in education. The question addressed by this review is whether new information, products, and programs are being utilized by potential users, defined as the classroom teacher, the individual school or the overall school system within some defined area.

Generally the focus in these investigations is process-oriented. That is, evaluations are made of the effectiveness of the dissemination processes within specific programs and factors relating to success or failure are outlined. In most cases, less emphasis is placed on user variables that might predict potential user awareness and utilization of information. In addition, definitions of user, non-user and potential user have been unclear and seem to vary from study to study.

The consensus of researchers in the area indicates that there is an under-utilization of available information. For example, studies investigating the impact of the Educational Resources Information Center (ERIC) have consistently cited the lack of awareness and utilization of services by potential users (Hoover, 1972; Wanger, 1972). Based on these types of findings the conclusion could be made that research must examine not only the process by which information is disseminated within the programs but also the users or potential users themselves.

In conjunction with NTS Research Corporation's study of the Capacity Building component of the State Dissemination Grants Program, this literature review will attempt to address the concept of user capacity. To obtain an overall understanding of what comprises the concept of "user capacity" we will examine literature dealing with questions such as: How do people become aware of existing information systems? What skills are necessary to

enable the user to seek out and utilize relevant information? In general, what capacities do users and potential users need to utilize available resources? In attempting to answer these questions, user capacity will be looked at from the organizational and individual levels and factors related to successful information use will be discussed.

However, this literature review is not to be considered a definitive statement but rather a supplement to some of the existing reviews in the area (e.g., Havelock, 1969; Glaser, et al., 1976). In addition, its primary focus will be on factors associated with user success in educational settings rather than on the theoretical underpinnings of information dissemination. These theories and their relation to the evaluation project being conducted by NTS Research Corporation are presented in an earlier literature review (Ctrang, 1977).

Conceptualization of Terms

In order to clarify concepts to be used in this paper, the meanings of user, non-user and potential user must be differentiated.

User: By user we mean anyone who uses information or information services. Use can be conceptualized, therefore, on those two levels and an individual can be a user of either the service, or the information provided by the service, or both. The use of information can be conceived as a continuum that can range from a simple scanning of documents to the actual implementation of a program based on the information provided. It should be noted, however, that the occurrence of change should not be used as the ultimate measure of information utilization. Crandall and Harris (1978) observe that traditional analyses of information use assume that some sort of change or program implementation represents the greatest degree of information utilization, yet the more sophisticated users will frequently "look to information to confirm their intentions, and to refine, rather than revamp current strategies (p. 3)." Having served that purpose, one would not evaluate information use based on change but on the degree to which the requestor's original needs were fulfilled.

Potential Users: These are persons to whom the information is directed. They can be thought of as the "target audience" in that it is their

needs the information is intended to serve. Brickley (1978) sees these terms as rather general in nature and says, "When a dissemination service defines its user population or user community or potential users or even intended users, it is speaking to a wished for state of high volume and reasonable frequency of use by some subset of the members of a broad class (p. 3)."

Non-Users: Finally, the term non-user refers to anyone who does not utilize the available information at any level due to lack of awareness or lack of motivation. Either one of these factors can result in nonuse of information although the former, lack of awareness, is probably easier to modify than the latter.

The relationship among the actual user, non-user and potential user can be used to evaluate the success of the outreach portion of the dissemination process. Outreach is considered more successful with an increasing match between the potential users and the actual users, since this indicates that the intended or target audience is actually using the information.

Non-users may or may not be part of the target audience. When they are, this can be evaluated as a failure of outreach; but these types of evaluations of success or failure are not so clearcut for users and non-users who are not part of the original target audience. In the case of the non-user who is not in the target audience, no predictions are made to evaluate this outcome of non-use. For the actual user who is not part of the potential audience, evaluations are also difficult, though it would seem the original specification of the target audience may have been less than complete or we are experiencing unexpected outcomes. For example: while ERIC was originally intended to provide information to educational practitioners, most results indicate that the majority of users are associated with universities and colleges.

The final category of "user" to be discussed here is the indirect user. This can be thought of as the second level of use in that the information is being passed along after being disseminated to the direct user. In the report on the Pilot State Dissemination Program, Sieber, Louis and Metzer (1972) discuss what they term the "ripple effect." The two aspects of this effect are the discussion of information with others and the user's giving or loaning the material to another person. Both result in an increase in coverage by the source and reflect positive evaluations by the clients.

This review will emphasize the potential user. That is, the focus will be on those factors which affect the potential user's capacity to seek out and utilize information for the accomplishment of goals and those factors which serve as obstacles to information use.

Capacity has been defined by Havelock (1969) as "the capability to retrieve and marshall diverse resources (p. 11-20)." This general concept of capacity is seen by Havelock as accounting for the variance found in different diffusion studies and as correlated with such resources as wealth, power, status, education, intelligence and sophistication. The more specific term, "user capacity," is defined as "the ability to assemble and vest his own internal resources and to call upon outside help (p. 11-25)." Correlated with user capacity are self-confidence, amount of available time, energy, education, sophistication, and size of operation. The factors that relate to user capacity, both organizationally and individually, are identified and discussed below.

General Factors Relating to the Organizational and Individual User

Although there are many differences between the information seeking and information utilization behaviors of the organizational and individual user, three factors relate to both: levels of use, user skills, and user motivation. In this case, the user may be an individual classroom teacher, a school, or a member of a local district or state education agency.

In their article dealing with the determination of program implementation, Hall and Loucks (1977) introduce the concept of "levels of use of the innovation (LoU)" which is an attempt to define and measure the degree to which an innovation or treatment has been implemented. Although this concept is concerned with innovations or implementations of new programs, use is part of implementation and so the definitions of use can be applied to the capacity of individuals and organizations to acquire and utilize information.

The levels of use range from nonuse to a second evaluation of program implementation in which modifications, based on the users' needs, are developed; (see Appendix A for a summary of the eight levels of use described by Hall and Loucks). The authors emphasize that the use of programs, innovations and information must not be assumed by researchers based

on classifications of people into experimental and control groups. The actual level of use must be ascertained prior to drawing conclusions about the effects of various treatments.

The second factor which relates to organizational and individual use, the skills of the user to seek out and utilize relevant information, is a crucial aspect of user capacity. In a study which compares four organizations in terms of their dissemination and utilization, Havelock and Lingwood (1973) outline what they term "user self-servicing," which includes many aspects of user skills. Five factors are subsumed under the concept of user self-servicing: 1) the user's internal problem-solving capability; 2) user need-awareness and self-scanning; 3) user need-expression/articulation; 4) user interest, skill and ability to seek out useful information and openness to new research and development findings and ideas; and 5) user capacity for adaptation and integration of solutions.

Although these factors were developed in relation to the operation of research and development organizations which serve consumers, they were applicable to the information user in general. To the extent that users possess these qualities and skills, their capacity to seek out and utilize information will be increased. Basically, these factors reflect an ability to perceive one's own needs, to make accurate diagnoses of problems, to know when and where to seek outside resources, to know how to express one's needs to that resource, and finally, what to do with the help and information obtained. Without one of these, the user will be unable to solve problems or maintain effectiveness in an optimal manner.

The third factor which relates to both organizational and individual user capacity, user motivation, deals with the incentives which are present in the user's environment. Although somewhat different types of incentives or reinforcers apply to the organizational and individual user, in general they serve to motivate the user to seek out and utilize available information. Based on past successes associated with particular information-seeking behaviors, an individual or organization will tend to repeat those behaviors.

Although the principle of reinforcement is fairly simple, predicting actual behaviors is difficult. Brittain (1970) has pointed out that it is not only the quality of the information obtained but also the complexity of

the user's environment that can provide numerous sources of reinforcement and affect outcomes. "During the course of the provision of material there may be thousands of contingencies open for reinforcement (p. 29)."

Regardless of this complexity, some general incentives have been outlined. In describing the state education agency as a dissemination system (as part of the Innovation Project on Dissemination), the authors mention a few of the incentives available which can motivate information use: recognition, the rewarding or sanctioning of the user's activities through commendations and awards; money, the provision of funding in the form of grants to facilitate the development of new programs and regulations and policies, the use of certification and accreditation to promote training and staff improvement of skills (IPOD, 1978). Incentives will be further discussed as they apply to the organizational and individual factors of user capacity.

Another principle related to the user's motivation for seeking out information has been described by Paisley (in Brinkley, 1978):

> . . . the concept of least effort is expressed in the notion that practitioners will attempt to minimize the expenditure of personal and organizational time and energy needed to obtain information. This principle of least effort operates in tension with the opposite principle of necessary quality, defined as the minimum requisite quality of the information required to satisfy the need which initiated the information-seeking behavior. Information users will seek information in a form and content which minimizes the organizational and personal expense of interpretation in both time and money (p. 3).

Organizational Factors Relating To User Capacity

Organizational factors deal with the ability and inclination of these organizations to be open to change and to the innovation. Research indicates that various factors can influence these tendencies and among these are organizational structure, organizational climate and a variety of personnel issues such as training, leadership, individual incentives offered, and professionalism. Each of these factors will be discussed below. Prior to considering each of these factors separately, however, the general concept of an innovative organization will be discussed.

Alderfer mentions a study conducted by Burns and Stalker (1961) in which the authors differentiate organizational success under pressure to be innovative. Those organizations which were unsuccessful in their attempts to change were termed mechanistic, characterized by impermeable internal boundaries around tasks and groups. The roles in mechanistic organizations tended to be more precisely defined and interaction was primarily hierarchical. In general, the organizational emphasis tended to be on organizational loyalty, local knowledge and obedience to superiors.

The organic organization, which was more successful in its attempt to change, tended to have more permeable internal boundaries around groups and tasks. Roles tended to be defined by the nature of the task and individual competencies of the members, and those roles tended to be redefined more frequently as tasks and problems changed. In addition, interactions tended to be both horizontal and vertical, taking the form of consultation rather than commands. Finally, authority tended to be more situational rather than positional, based on a person's competence at a particular task rather than on the person's authority within the organization.

Although causality cannot be inferred, it seems reasonable to postulate that organizations open to change are those which tend to have more open internal boundaries and mutual relationships within the organization. This hypothesis about the effects of permeability seems applicable to external boundaries also. Aiken and Hage (1968) found a strong, positive relationship between the number of cooperative, inter-agency programs in which a particular organization was involved and the number of new programs in which they were involved, another indication of innovativeness.

The more open boundaries of those organizations working with other agencies helped produce the important awareness of the state of the external world. It is this openness and sensitivity to the external world which is crucial to the effectiveness of the organization. Alderfer's data indicate as well that organizations characterized by highly permeable internal boundaries and mutual relationships among members and subdivisions tend to have permeable external boundaries also.

Organizational Structure

Organizational structure factors such as size and centralization have been studied in relation to the capacity of the organization to seek out and utilize information. Mansfield (1963) found that the size of an organization is positively related to adoption of new ideas and technologies. Markham

(1965), however, pointed out that this relationship may be curvilinear, with extremely large organizations being less innovative than moderately large ones. The lack of conclusive data makes it impossible to make precise statements about the relationship between the size of the organization and its capacity to utilize information.

Another structural variable affecting organizational innovation deals with linkages or couplings among the subunits. Louis, Rosenblum and Spencer (1978) define "loose couplings" as "the notion that the linkages between educational subsystems are relatively weak compared with other types of organization (pp. 17-18)." This factor influences the degree to which decisions about innovations and new programs will filter down and be accepted by lower levels in the organization.

Mason (1978) has conceptualized the needs of the client which must be fulfilled by the service organization as the discrepancy between the client's overall program needs and the capacity of the client to fulfill its own needs. An aspect of this client capacity would be the ability of the organization to maintain an adequate knowledge flow and utilization within the organization. One structural characteristic associated with this capacity is the organization's centralization or decentralization. Centralized organizations are traditionally characterized by decision-making at the top while decentralized organizations tend to have more autonomous sub-units. Havelock (1969) cites evidence that decentralization can lead to increased capacity for knowledge flow and utilization among the members of a decentralized unit, but it may hamper dissemination between the units of the organization.

Organizational Climate

Another factor that concerns capacity of organizational information use is the organizational climate. Campbell, Dunnette, Lawler and Weick (1970) present four dimensions which help to define this concept: 1) individual autonomy; 2) degree of structure imposed on the individual positions; 3) reward orientation; and 4) consideration, warmth and support. Organizational climate may be inferred from objective indicators, such as absenteeism, turnover and labor/management problems, as well as subjective indicators such as survey instruments intended to tap individuals' perceptions of the organization.

Each of the factors mentioned by Campbell, et al., will affect the information processing variables in that they communicate something to the individuals in the organization about the attitude toward innovation and risk-taking. Organizational climate is a general atmosphere, however; though it is critical to the capacity of the organization, it is difficult or impossible to manipulate it without extensive intervention. Perhaps its value to the study of user capacity is that, by investigating the climate of a particular organization prior to implementing programs, program developers can design different strategies of implementation for different types of organizations.

On a more specific level, one can discuss how the organization deals with particular problems as they arise. Berman and McLaughlin (1977) concluded that innovations either can be "opportunistic" or "problem-solving." "Problem-solving" innovations tend to be incorporated to a greater extent than do "opportunistic" ones.

Based, in part, on this finding, Louis, et al. (1978) emphasized the importance of the problem context in which the innovation takes place. The important dimensions of the educational problem context discussed are:

- the level of consensus within the school about the nature of the problems;
- the centrality of the problem: Does it affect core functions?
- the uniqueness of the problem: Is it one of many undefined problems, one of few, or the only identified problem?
- the scope of the problem: What proportion of the students and staff are affected?
- the complexity of the problem: How difficult would it be to solve?
- the source of the problem definition: Was the problem defined internally, or did an external source identify the problem?
- the level of problem-solving effort: Have attempts been made to solve the problem in the past, and what level of effort has been attached to these? (pp. 27,28.)

Among the personnel issues that relate to an organization's capacity to process information are training, leadership, professionalism and incentives. Each of these can affect the motivational level and skills of the people within the organization to seek out and utilize information resources.

Organizational training programs communicate to the personnel whether knowledge utilization is encouraged or whether employees should maintain the "status quo." Havelock (1969) mentions some of the training areas of importance to user capacity: crisis perception, awareness of external resources, and administrative changes. The importance of these factors is that emphasis upon them may result in new or increased training programs and/or they may be the subject of the training courses and result in greater information processing skills for the personnel. At a minimum, this emphasis will underline the organization's attitude toward innovations.

The leadership of the organization, as a whole and within specific divisions, also influences user capacity. Studies have demonstrated repeatedly the importance of the role of the principals in the implementation of innovations in school settings (Louis, et al., 1978). Among the leadership skills necessary to facilitate effective information use are the ability of the leader to create a consensus within the organization as to the nature of the problem and its optimal solution, and the ability to reinforce new attitudes, values, and behaviors that may emerge from new information and innovations.

Hollander (1958, 1964) has described the way in which a group member can influence group norms and behaviors through innovations. Leaders can earn "idiosyncratic credits" within the group by generally conforming to the expectations of the group and helping to lead the group toward its goals. The value of these idiosyncratic credits is to permit the leader to display deviant and/or innovative behaviors which may violate group norms. There are limits, however, to the freedom these credits afford. Hackman (1976) reviews findings which suggest that this freedom to deviate exists only so long as it is not detrimental to the accomplishment of group goals.

Although many attempts have been made to discover the personality traits associated with effective leadership, no such personality inventory exists. Available data seem to indicate that leadership is a complex interaction of the particular situation and the personality and opinion of the individual leader.

Along with the type of leadership in the organization, a change in leadership also has an effect on innovation and use of information. Havelock (1969) reviews studies dealing with the effect of a change in command on the entry of new ideas into the organization. Griffiths (1964) found an inverse relationship between the number of new innovations and the tenure of the chief administrator. The basis of this finding seems to be that with the entry of new leadership come new knowledge, perspectives and ways of doing things.

Another variable in this relationship is whether the new leader comes from within the organization or is imported from the outside. When leaders come from outside there seems to be more change in the organization (Griffiths, 1964).

Another aspect of personnel issues relating to organizational capacity is professionalism. Havelock (1969) states:

> Another means by which knowledge entry can be facilitated is increased professional affiliation or identity. An organization member with strong professional ties is quite likely to be interested in applying and advancing his profession. In many cases, his organizational commitment may be less important to him than his desire to actively pursue interests in his chosen specialty field (p. 6-15).

This feeling of professionalism is especially important within school systems which the members perceive as poor in quality. Instead of attaching importance to the school in which they work, the teachers may emphasize the importance of being a good teacher (Kimbrough, 1965). In addition, this feeling of professionalism may increase the tendency of these people to join various professional groups and associations. This, in turn, will most likely increase their contact with current information and innovations being made in other organizations and settings.

The final personnel issue of interest to user capacity is the incentives available to individuals. Of interest to this topic are the factors discussed by Hinrichs (1976) which influence the course of skill acquisition and that are within the control of the organization. Although these factors deal specifically with personnel training, they serve in general as incentives and motivators for the individual to make use of information; these factors are: 1) overall organizational norms, role expectations, policies, support, recognition, etc.; 2) formal and informal rewards, enhanced job competence, advancement potential, etc.; 3) supportive supervision, managerial pressure and expectations, and 4) peer recognition, acceptance, pressure and the informal social system.

Organizational Environment

Along with the environmental factors discussed above, other environmental factors include budgetary support, maintenance, and supplies and explicit organizational procedures for linking innovations to other aspects of agency operations (Yin, 1978). Louis, et al. (1978), in discussing the organizational success in implementing solutions to problems in educational settings, cite the work of Miles (1977). Miles identifies indicators of success in the implementation of educational change: 1) adequate obtained financial support or material resources; 2) environmental endorsement (support for the innovation from appropriate groups in the school or school system; 3) quality of planning/implementation decisions (concurrence by stakeholders that the decisions are "good" and technically "right"); 4) ownership of planning/implementation decisions, commitment to the decision.

To conclude this section dealing with organizational factors relating to capacity, we offer a note of caution. Though all the factors are important, some of the research cited was conducted among industrial rather than educational organizations and settings, and the differences between the two are great. Louis, et al. (1978) outline some of the characteristics of educational organizations which are different than those in industry, including: 1) more diverse goal structures; 2) fewer pressures for competition; 3) limited independence among subsystems; 4) more difficulty in evaluating the quality of outcomes; 5) more autonomy for workers; and 6) differ-

ences in the change processes in educational systems due to federal funding (p.5). Hence, all the organizational factors should be taken into account prior to program implementation, but specific predictions about the effects of variables must await further research in educational settings.

Individual Factors Relating To User Capacity

The capacity of individual users is seen to consist of those factors which facilitate or inhibit their tendency to seek out and use available resources for the accomplishment of goals or for the enhancement of knowledge in a specified field. The factors discussed here include: the user's attitude toward new information or innovations; the skills of the user to deal with new information; the user's needs for certain types of information; the user's problem-solving style; and the fact that persons with different roles and functions within a target population will tend to have differing information needs.

Attitudes, Values and Personality Variables

The attitudes of the user towards the use of new information or the implementation of new programs is based on the person's past experiences and certain personality traits. Sieber, Louis and Metzger (1972) mention the importance of attending to the client's initial skepticism. "All of the field agents in this pilot project recognized the need to build trust relationships with clients in order to overcome anxiety in revealing problems or skepticism about the benefits of the program (p. 20)." In that study the investigators found that the clients would submit requests on unimportant topics in order to "test the water" and to compare their own expertise in particular areas with the results obtained from the requests. The importance of overcoming this initial skepticism and anxiety is supported by the authors' finding that, through familiarity and experience with the system, the clients needed less help in utilizing the information they received.

Among the personality traits which have been shown to be associated with a person's tendency to attend to and/or react to new information are a sense of competence, authoritarianism and the person's own value system. Although these traits are not readily amenable to manipulation, they increase one's understanding of the factors that influence user capacity.

White (1963) has defined "sense of competence" as the "cumulative result of the whole history of transactions with the environment... In the mature adult the sense of competence may be well organized and differentiated with respect to different spheres of activity. We learn what we can and cannot do, and we may be satisfied to concentrate on the former (p. 39)." Guskin (in Havelock, 1969) relates this quality to confidence in one's abilities and the tendency to try new innovations and evaluate new information. With this increased sense of confidence, the possibility of the new information posing a threat is decreased. One would question, however, whether persons with little confidence in their skills in a particular area would have such a tendency to reject new information. Without any criterion by which to judge the adequacy of the new information, it would seem that persons would have a greater tendency to accept new information in order to increase their competence within a particular area.

Authoritarianism is another personality variable which has received quite a bit of attention in the past and has been discussed in relation to the user's tendency to utilize information. Guskin (in Havelock, 1969) concludes that one of the most important aspects of the authoritarian personality is the fact that it is associated with a low level of tolerance of ambiguity. The characteristic behaviors of these personality types, listed by Guskin, are a tendency to hold on for a long time to an initial interpretation about which they were certain; a tendency to respond quite slowly when faced with changes in their environment; and a tendency not to see things that cannot be reconciled with their prior interpretation of a situation.

Although these findings have not been accepted without criticism, they point out the importance of personality variables in the study of user capacity. Without taking into account the user's personality and cognitive style, the diffusion and implementation stages may be hampered. The problem seems to be that such information is difficult to collect and even more difficult, if not impossible, to apply for the purpose of effecting change; but linkers should try to evaluate their clients on those dimensions nevertheless to increase the probability that the information provided will be utilized.

Another variable purported to be of importance in the study of individual factors, is the value system of the individual. Research has shown that when new programs and innovations are in direct conflict with a person's values, the new ideas will be rejected (e.g., Luschinsky, 1963). This same research has demonstrated, however, that by pointing out an association between the individual's values and the proposed change, this resistance may be overcome. It is the duty of the innovator or linker, therefore, to discover the associations which are possible in facilitating the acceptance of new information.

When this is not possible, new courses of action must be taken. Havelock (1964) has outlined some of the strategies which might be undertaken:

- Put emphasis on those values which are shared by the source and receiver.
- By-pass value issues.
- Negotiate value issues.
- Expose value issues to let receivers know that their values are recognized and respected.
- Find key values and appeal to them.
- Respect value barriers as valid.

Although these strategies are not mutually exclusive, they provide information disseminators with some framework within which they can deal with potential value conflicts.

Market Segmentation

Individual variables are also of use in identifying various sub-groups in the overall target population which may have different needs. Reed (1978) has pointed out that "it is extremely important that the organization recognize that some parts of the actual market will have more interest and more resources and will be more responsive to the product or service than others (p. II-6)."

The process of market segmentation has been outlined by Kotler, Calder, Sternthal and Tybout (1977) to involve the following steps:

1. Selection of segmentation variables which represent the major differences within the target group, based on individual needs.
2. Investigations of the utility of these variables, i.e., research as to whether users really do differ in terms of these variables.
3. Examination of the segments in terms of the organization's resources and objectives to determine whether it is worthwhile to treat each as a separate target group.

In addition, Kotler (1975) has outlined some of the major variables used for market segmentation and their typical breakdown (presented in Appendix B). Reed (1978) points out that along with providing more accurate information to program administrators for decisions about allocating program resources across target populations, segmentation has implications for package design and for devising client-specific linkage.

Information-Seeking Behaviors

Another important individual factor relating to user capacity is information-seeking behavior. That is, how do users typically approach the information utilization process and what, if any, variables exist which may help in predicting their behavior and success or failure in utilizing resources.

Hood and Blackwell (1976) investigated the information needs and habits of educational researchers and practitioners as a function of various contextual, positional, and personal variables. Contextual data consisted of information about the user's organization type, educational level of job focus, and population density of the community in which the job is set; positional variables dealt with the actual type of work performed by the educator; and personal variables included demographic factors such as age, sex, ethnicity, degree level, and months in job. Another predictor variable tapped in that study related to the information resources available to the individual and included questions about perception of isolation and budget for information search.

Those predictor variables were studied in relation to outcome variables termed "sociometric," "purpose," and "source used/preferred." Sociometric refers to the number and professional level of people to whom the user communicates information; purpose is, obviously, the purpose for which the individual seeks out information; and source used/preferred deals with the perceived ease of use. Although the authors performed various multivariate analyses on the data, and found complex relationships among the predictor and outcome variables, those specific results are not as applicable to the present discussion as are their overall conclusions, among them the observation that "patterns of infor-

nation use may be as much personal styles as they are requisites or consequences of the user's job or position. (p. V-2)"

User Needs

Probably the most frequently investigated individual factor relating to the dissemination and utilization process is the information needs of the user. Information needs are especially important in the evaluation of various dissemination systems since pre-stated needs provide a ready criterion for evaluation. That is, the person's purpose in seeking out the information can be compared with his/her evaluations of the extent to which those needs were satisfied by the information and the degree to which the information was utilized. Crandall and Harris (1978) point out that "effective assessment of use therefore requires knowing first how the information was intended to be used (p. 4)." These authors go on to describe two methods of analyzing information utilization, one based on the "congruence of use with need" and the other based on the extent to which the information being considered by a system/individual confirms existing practice.

The differentiation between user needs and user demands may be somewhat hazy. Brittain (1970) defines user needs as a continuum. At one end the user "knows of all the information that is relevant to his work, and makes a demand to an information source." At the other end is the user "who makes few demands but has many needs." The fact that the person does not make a demand may be a result of the inability to articulate the need or a lack of awareness of the need.

Lancaster (1978) has pointed out that the relationship between user needs and user demands is somewhat neglected in evaluation studies concerning user needs and uses of information systems. The result of studying the demands made by current users is that the information services move closer to the expressed demands of the users but further away from both the actual needs behind those demands and the needs of the users which are not converted into demands. In addition, by utilizing results of studies concerned with the demands of users, the information services tend to emphasize the most frequently occurring demands rather than attempting to understand the needs of the non-user and ways to increase the awareness of the non-user.

Mason (1978) has differentiated among the various types of client needs, using Paisley and Butler's conceptualization. The relationship is stated as follows:

Client Service Needs = Client Program Needs - Client Capacity

Client program needs can be thought of as the overall information needs of the client in implementing a program; client service needs refer to the needs of the client for external resources. The latter term can be thought of as the program needs which the client does not have the capacity to fulfill. This idea emphasized the need to assess the user's capacity to be able to accurately diagnose the user's (client's) service needs. This would result in a more individualized, client-by-client approach as compared to an approach which specifies client needs primarily on the basis of the type of program being undertaken.

An additional factor influencing user needs deals with the form rather than the topic of the information as it is delivered to the user. That is, are users able to fully understand the information as presented or do they require a "linker" to facilitate interpretation and utilization of the material? Sieber, Louis and Metzer (1972) address this question in their description of the expectations and reactions of clients to follow-up visits by field agents who served as linkers by helping the clients understand the material delivered. The authors list some of the factors which should be taken into account in deciding whether the use of personal interaction is necessary in the delivery of materials. They are: 1) the client's desire for having material personally delivered and/or receiving follow-up assistance; 2) the nature of the client's request in terms of the specificity and scope of the need or problem, in that requests which are more specific and smaller in scope generally require less intervention; 3) characteristics of the clients and their organizations in terms of their skills and motivations to use information; 4) characteristics of the material, such as readability and technicality; and 5) linker's familiarity with the topic.

Among the variables which can influence the needs of the individual user are the type of work performed by the user, the specific discipline in which the information user is involved, and the user's awareness of

information resources. Lin and Garvey (1972) discuss these factors in their article on information needs and uses. The fact that a person's work is basic or applied, or classifies oneself as a researcher or a practitioner, influences the quantity, quality and form of the information needed. Lin and Garvey point out that researchers doing more basic work need both a large amount of information as well as more current publications than do practitioners. Line, Brittain and Cranmer (1971) report that people who are employed by educational institutions and doing basic work report more frequent use of abstracts than do those in more applied work with governmental settings. These results indicate that the nature of the work performed by the information user has an impact on needs as well as behaviors.

The user's awareness of information resources was mentioned previously in connection with the under-utilization of resources. Of particular interest to education information-processing systems are the factors cited by Hoover (1972) as contributors to this problem. He points out that the literature of education is of such high volume and so lacking both in scientifically verified propositions and reliable program evaluations that syntheses of practical experience and research findings are rare; educators tend rather to rely on face-to-face communications with colleagues, anecdotal information, and the advice of others. Hoover recommends, therefore, that practitioner/decision-makers be provided with concrete answers to specific problems or with syntheses of pertinent information to enhance its practicality or expedite its application.

In summary, the capacity of the individual to utilize information is influenced by the ability of users to be aware of their needs, to articulate those needs to an outside resource, and to be aware of relevant sources of information. Without these abilities, the potential user remains ignorant of needs or is unable to deal with known problem areas.

Conclusions

Based on the material reviewed here, some recommendations may be made as to new directions for the study of information dissemination and utilization as well as specific recommendations for program imple-

mentation. The first recommendation deals with program implementation and is based on the work of Rell and Louche (1977): the actual level of use within a specific program should not be assumed based on the classification of groups into experimental and control but should be verified if possible on an individual level.

The individual and organizational factors discussed above are not easily modifiable, especially by external agents, but they must be taken into account prior to the actual implementation of programs. Specifically, program planning requires a careful analysis of the target organization. In addition, the personality traits and value systems of the individual users must be considered and strategies for resolving potential conflicts should be developed. Finally, the capabilities of the user to be aware of needs and articulate these needs into demands must be assessed.

User skepticism and the factors which inhibit the use of information must be addressed. Concurrently, the incentives which are available must be emphasized.

The final recommendations deal with the study of information use and dissemination in education in general. First, more emphasis is needed on the relationship between the user's needs and demands. What are the factors which determine whether a need is actually converted into a demand, and to what extent are the demands representative of the actual, underlying need?

Another important study area is the relative awareness of potential users of the services and resources available. What methods produce the most effective outreach and are there ways that individuals communicate about services which are not being used to facilitate user awareness? Do different sub-groups require different outreach programs? These questions need to be addressed to combat what Lancaster (1978) terms an increasing tendency on the part of the information services to become exclusively responsive to the demands of current users.

Finally, the exact nature of the relationship between organizational factors and user capacity should be examined. These factors need not be studied individually, as effects are probably multiply determined. That is, clusters of factors (e.g., size, centralization, organizational climate) probably interact to produce capacity and, therefore, should be studied together. The previously mentioned work of Burns and Stalker (1961), concerning the success of organizations at changing under pressure, provides an example of such an approach.

APPENDIX A

LEVELS OF USE	DEFINITION OF USE
0 Nonuse	State in which user has little or no knowledge of the information, no involvement with the information and is doing nothing toward becoming involved.
1 Orientation	State in which the user has recently acquired information and/or has recently explored or is exploring its value orientation and its demand upon user and user system.
2 Preparation	State in which the user is preparing for first use of innovation based upon information.
3 Mechanical Use	State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a step wise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use
4a Routine	Use of the innovation is stabilized. Few, if any, changes are made in ongoing use. Little preparation or thought is given to improving innovation or its consequences.
4b Refinement	State in which the user varies the use of the innovation to increase the impact on clients within the immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients
5 Integration	State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.
6 Renewal	State in which the user reevaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals in self and the system.

From: Hall, G.E. and Loucks, S.F., "A Developmental Model for Determining Whether the Treatment is Actually Implemented," American Educational Research Journal. 1977, 14, 263-276.

Appendix 3

Major Segmentation Variables and their Typical Breakdowns

Variables	Typical Breakdowns
Geographic	
Region	Pacific; Mountain; West North Central; West South Central; East North Central; East South Central; South Atlantic; Middle Atlantic; New England
County size	A; B; C; D
City or S.M.S.A. size	Under 5,000-19,999; 20,000-49,999; 50,000-99,999; 100,000-249,999; 250,000-499,999; 500,000-999,999; 1,000,000-3,999,999; 4,000,000 or over
Density	Urban; suburban; rural
Climate	Northern; Southern
Demographic	
Age	Under 6; 6-11; 12-17; 18-34; 35-49; 50-64; 65+
Sex	Male; female
Family size	1-2; 3-4; 5+
Family life cycle	Young, single; young, married, no children; young, married, youngest child under 6; young, married, youngest child 6 or over; older, married, with children; older, married, no children under 18; older, single; other
Income	Under $5,000; $5,000-$7,999; $8,000-$9,999; $10,000-$14,999; over $15,000
Occupation	Professional and technical; managers, officials, and proprietors; clerical, sales; craftsmen, foreman; operatives; farmers; retired; students, housewives; unemployed
Education	Grade school or less; some high school; graduated high school, some college; graduated college
Religion	Catholic; Protestant; Jewish; other
Race	White; Negro; Oriental
Nationality	American; British; French; German; Eastern European; Scandinavian; Italian; Spanish; Latin American, Middle Eastern; Japanese and so on.
Social class	Lower-lower; upper-lower; lower-middle; middle-middle; upper-middle; lower-upper; upper-upper
Psychographic	
Life style	Swinger; status seeker; plain Joe; etc.
Personality	Compulsive; gregarious; conservative; ambitious; etc.
Benefits sought	Economy; convenience; dependability; prestige; etc.
User status	Nonuser; potential user; first-time user; regular user; ex-user
Usage rate	Light user; medium user; heavy user
Loyalty status	None; medium; strong; absolute
Readiness stage	Unaware; aware; informed; interested; desirous; intending to buy

Source: Kotler, P. Marketing for nonprofit organizations. Englewood Cliffs, New Jersey: Prentice Hall, 1975.

REFERENCES

Aiken, M. and Hage, J., "Organizational Interdependence and Intra-organizational Structure," American Sociological Review, 1968, 33, pp. 912-930; in M.D. Dunnette (Ed.), Handbook of Industrial/Organizational Psychology. Chicago: Rand, McNally, 1976, 829-860.

Alderfer C.P., "Change Processes in Organizations," in Campbell, J., Dunnette, M.D., Lawler, E.E. and Weick, K.E., Managerial Behavior, Performance, and Effectiveness. New York: McGraw-Hill, 1970, pp. 1591-1638.

Berman, P. and McLaughlin, M., Federal Programs Supporting Educational Change, Volume VII. Santa Monica: Rand Corporation, 1978.

Brickley, R.R., "Clients, Users and Non-Users: Some Preliminary Explications." Unpublished paper, NTS Research Corporation, 1978.

Brittain, J.M., Information and Its Use. New York: John Wiley & Sons, Inc., 1970.

Burns, T., and Stalker, G.M., The Management of Innovation. London: Tavistock, 1961.

Campbell, J., Dunnette, M.D., Lawler, E.E. and Weick, K.E., Managerial Behavior, Performance, and Effectiveness. New York: McGraw-Hill, 1970.

Crandall, D.P. and Harris, R.C., "Views on the Utilization of Information by Practitioners." Unpublished paper, NTS Research Corporation, 1978.

Glaser, E., Abelson, H., McKee, M., Watson, G., Garrison, K. and Lewin, M., Putting Knowledge to Use: A Distillation of the Literature Regarding Knowledge Transfer and Change. Los Angeles: Human Inter-Action Research Institute, 1976.

Griffiths, D.E., "Administrative Theory and Change in Organizations," in M.B. Miles (Ed.), Innovation in Education. New York: Bureau of Publications, Teachers College, Columbia University, 1964.

Guskin, A.E., "The Individual," in R.G. Havelock (Ed.), Planning for Innovation. Ann Arbor: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1969.

Hackman, J.R., "Group Influences on Individuals," in M.D. Dunnette (Ed.), op. cit., pp. 1455-1526.

Hall, G.E. and Loucks, S.F., "A Developmental Model for Determining Whether the Treatment is Actually Implemented," American Educational Research Journal. 1977, 14, 263-276.

Havelock, R.G., Research Utilization Report: Analysis of Seminar Sessions. Institute for Social Research, 1964.

Havelock, R.G., Planning for Innovation. Ann Arbor: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1969.

Havelock, R.G., and Lingwood, D.A. R&D Utilization Strategies and Functions: An Analytical Comparison of Four Systems. Ann Arbor: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1973.

Hinrichs, J.R. "Personal Training," in M.D. Dunnette (Ed.), op. cit., pp. 829-860.

Hollander, E.P. "Conformity, Status, and Idiosyncracy Credit," Psychological Review, 1958, 65, pp. 117-127.

Hollander, E.P., Leaders, Groups, and Influence. New York: Oxford University Press, 1964.

Hood, P.D. and Blackwell, L., Key Educational Information Users and Their Styles of Information Use, Vol. I. San Francisco: Far West Laboratory for Educational Research and Development, 1976.

Hoover, C.W., "The ERIC Program: Problems and Prospects," Access to the Literature of the Social Sciences and Humanities. Flushing, N.Y.: Queens College Press, 1972, 134-135.

Interstate Project on Dissemination, Report and Recommendations, NIE, Washington, D.C., 1976.

Kimbrough, R.B., "Community Power Structure and Curriculum Change," Strategies for Curriculum Change. Association for Supervision of Curriculum Development, Washington, D.C., 1965, pp. 55-71.

Kotler, P., Marketing for Nonprofit Organizations. Englewood Cliffs: Prentice-Hall, Inc., 1975.

Kotler, P., Calder, B.J., Sternthal, B. and Tybout, A.M. "A Marketing Approach to the Development and Dissemination of Educational Products," in Information Dissemination and Exchange for Educational Innovations. Evanston: Northwestern University, 1977.

Lancaster, F.W., "The Tip of the Iceberg" Bulletin of the American Society of Information Science. 1978, 4, p. 32.

Lin, N. and Garvey, W.D., "Information Needs and Uses in Science and Technology," in C.A. Cuadra (Ed.), Annual Review of Information Sciences and Technology. American Society for Information Science, Washington, D.C., 1972, pp. 5-37.

Line, M.B., Brittain, J.M. and Crammer, F.A., Information Requirements of Social Scientists in Governmental Departments: Investigation into Information Requirements of the Social Sciences. Bath University of Technology, University Library, Bath, 1971. (Research Report No. 2, ERIC Document Reproduction Services No. ED 049 774.)

Louis, K.S., Rosenblum, S., Spencer, G., "Dissemination, Utilization and Change in Schools," Draft. Cambridge, Massachusetts: Abt Associates, 1978.

Luschinsky, M.S., "Problems of Culture Change in the Indian Village," Human Organizations, 1963, 22, pp. 66-74.

Mansfield, E., "Speed of Response of Firms to New Techniques," Quarterly Journal of Economics, 1963, 77, pp. 290-359.

Markham, J.W., "Market Structure, Business Conduct and Innovation," American Economic Review: Papers and Proceedings, 1965, 55, pp. 323-332.

Mason, W., "Notes on User Capacity." Unpublished paper. Washington, D.C.: National Institute of Education, 1978.

Miles, M., "Creating New Schools." Unpublished paper. Washington, D.C.: National Institute of Education, 1977.

Reed, L., "Marketing: Exploring Applications for Educational Dissemination." Durham, N.C.: NTS Research Corporation, 1978.

Sieber, S., Louis, K.S. and Metzer, L., The Use of Educational Knowledge, Volumes 1 & 2. Bureau of Applied Social Research, Columbia University, 1972.

Strang, E.W., Building Capacity in Dissemination: Literature Review. Durham, N.C.: NTS Research Corporation, 1977.

Wanger, J., Evaluation Study of NCEC Information Analysis Products: Final Report, Vol. I., "Description of Study, Methodology and Findings." System Development Corporation, Falls Church, 1972. (ERIC Document Reproduction Service No. ED 064 527.)

White, R., "Ego and Reality in Psychoanalytic Theory," Psychological Issues, 1963, III (3).

Yin, R.K., Changing Urban Bureaucracies: How New Practices Become Routinized. Santa Monica: Rand Corporation, 1978.